



Callaway Plant

November 25, 2020

ULNRC-06620

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

10 CFR 50.73

Ladies and Gentlemen:

**DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
UNION ELECTRIC COMPANY
RENEWED FACILITY OPERATING LICENSE NPF-30
LICENSEE EVENT REPORT 2020-06-00
REACTOR TRIP DUE TO MAIN GENERATOR GROUND FAULT**

The enclosed license event report is submitted in accordance with 10 CFR 50.73(a)(2)(iv)(A) to report a reactor protection system and auxiliary feedwater actuation.

This letter does not contain any new commitments

Sincerely,

A handwritten signature in black ink, appearing to read "Fred Bianco", written in a cursive style.

Frederick Bianco
Senior Director, Nuclear Operations

Enclosure
LER 2020-006-00

ULNRC-06620
November 25, 2020
Page 2 of 3

cc: Mr. Scott A. Morris
Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
1600 East Lamar Boulevard
Arlington, TX 76011-4511

Senior Resident Inspector
Callaway Resident Office
U.S. Nuclear Regulatory Commission
8201 NRC Road
Steedman, MO 65077

Mr. M. Chawla
Project Manager, Callaway Plant
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U. S. Nuclear Regulatory Commission
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Washington, DC 20555-0001

Index and send hardcopy to QA File A160.0761

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NRC FORM 366 (08-2020)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB: NO. 3150-0104		EXPIRES: 08/31/2023			
LICENSEE EVENT REPORT (LER) (See Page 3 for required number of digits/characters for each block) (See NUREG-1022, R.3 for instruction and guidance for completing this form https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)										
1. Facility Name Callaway Plant, Unit No. 1					2. Docket Number 05000483		3. Page 1 OF 3			
4. Title Reactor Trip due to Main Generator Ground Fault										
5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	Docket Number
09	27	2020	2020	- 006 -	00	11	25	2020	Facility Name	Docket Number
										05000
										05000
9. Operating Mode MODE 1						10. Power Level 98%				
11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)										
10 CFR Part 20		<input type="checkbox"/> 20.2203(a)(2)(vi)		<input type="checkbox"/> 50.36(c)(2)		<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)		<input type="checkbox"/> 50.73(a)(2)(x)		
<input type="checkbox"/> 20.2201(b)		<input type="checkbox"/> 20.2203(a)(3)(i)		<input type="checkbox"/> 50.46(a)(3)(ii)		<input type="checkbox"/> 50.73(a)(2)(v)(A)		10 CFR Part 73		
<input type="checkbox"/> 20.2201(d)		<input type="checkbox"/> 20.2203(a)(3)(ii)		<input type="checkbox"/> 50.69(g)		<input type="checkbox"/> 50.73(a)(2)(v)(B)		<input type="checkbox"/> 73.71(a)(4)		
<input type="checkbox"/> 20.2203(a)(1)		<input type="checkbox"/> 20.2203(a)(4)		<input type="checkbox"/> 50.73(a)(2)(i)(A)		<input type="checkbox"/> 50.73(a)(2)(v)(C)		<input type="checkbox"/> 73.71(a)(5)		
<input type="checkbox"/> 20.2203(a)(2)(i)		10 CFR Part 21		<input type="checkbox"/> 50.73(a)(2)(i)(B)		<input type="checkbox"/> 50.73(a)(2)(v)(D)		<input type="checkbox"/> 73.77(a)(1)(i)		
<input type="checkbox"/> 20.2203(a)(2)(ii)		<input type="checkbox"/> 21.2(c)		<input type="checkbox"/> 50.73(a)(2)(i)(C)		<input type="checkbox"/> 50.73(a)(2)(vii)		<input type="checkbox"/> 73.77(a)(2)(i)		
<input type="checkbox"/> 20.2203(a)(2)(iii)		10 CFR Part 50		<input type="checkbox"/> 50.73(a)(2)(ii)(A)		<input type="checkbox"/> 50.73(a)(2)(viii)(A)		<input type="checkbox"/> 73.77(a)(2)(ii)		
<input type="checkbox"/> 20.2203(a)(2)(iv)		<input type="checkbox"/> 50.36(c)(1)(i)(A)		<input type="checkbox"/> 50.73(a)(2)(ii)(B)		<input type="checkbox"/> 50.73(a)(2)(viii)(B)				
<input type="checkbox"/> 20.2203(a)(2)(v)		<input type="checkbox"/> 50.36(c)(1)(ii)(A)		<input type="checkbox"/> 50.73(a)(2)(iii)		<input type="checkbox"/> 50.73(a)(2)(ix)(A)				
<input type="checkbox"/> Other (Specify here, in Abstract, or in NRC 366A).										
12. Licensee Contact for this LER										
Licensee Contact T. B. Elwood, Supervising Engineer, Regulatory Affairs and Licensing								Phone Number (Include Area Code) 314-225-1905		
13. Complete One Line for each Component Failure Described in this Report										
Cause	System	Component	Manufacturer	Reportable To IRIS	Cause	System	Component	Manufacturer	Reportable To IRIS	
14. Supplemental Report Expected						15. Expected Submission Date				
<input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)				Month		Day	Year	
16. Abstract (Limit to 1560 spaces, i.e., approximately 15 single-spaced typewritten lines)										
<p>On September 27, 2020 at 0203 with the reactor at 98% power during the cycle 24 coastdown, a main generator fault occurred that lead to a turbine trip and reactor trip. Safety systems functioned as required, including actuation of the auxiliary feedwater system, and the Operations staff responded to the event in accordance with applicable plant procedures. The post trip investigation indicated that a fault in the 25-kV portion of the generator output actuated the main generator protection system, which in turn caused the turbine trip (with reactor power above the P-9 setpoint) and an automatic reactor trip.</p> <p>An ENS notification (ENS 54916) was made for this event.</p> <p>The cause of the generator fault was due to a detached section of a flexible link in the B phase of the isophase bus ductwork.</p> <p>All flexible links were inspected during refueling outage 24 and repairs completed.</p>										

NRC FORM 366A (08-2020)	U.S. NUCLEAR REGULATORY COMMISSION LICENSEE EVENT REPORT (LER) CONTINUATION SHEET	APPROVED BY OMB: NO. 3150-0104 <small>Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollections.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk alt: oira_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.</small>	EXPIRES: 08/31/2023
<small>(See NUREG-1022, R.3 for instruction and guidance for completing this form https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)</small>			
1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER	
Callaway Plant, Unit No. 1	05000-483	YEAR 2020	SEQUENTIAL NUMBER - 006
<div style="margin-bottom: 10px;"> NARRATIVE 1. DESCRIPTION OF STRUCTURE(S), SYSTEM(S), AND COMPONENT(S): <p>The systems and components affected by this event include the reactor trip system and the unit main generator.</p> <p>The reactor trip system at Callaway Plant initiates a unit shutdown, based on the values of selected unit parameters, to protect against violating the core fuel design limits and reactor coolant system pressure boundary during anticipated operational occurrences and to assist the Engineered Safety Features systems in mitigating accidents.</p> <p>The main generator has a number of trips in order to protect this asset from irreparable damage. The main generator isophase buses transport electrical power from the main generator to the main step-up transformers, unit auxiliary transformer, and excitation transformer.</p> </div> <div style="margin-bottom: 10px;"> 2. INITIAL PLANT CONDITIONS <p>Callaway was at 98% Power/Mode 1 performing the cycle 24 coastdown at the time of this event.</p> </div> <div style="margin-bottom: 10px;"> 3. EVENT DESCRIPTION <p>On September 27, 2020 at 0203 with the reactor at 98% power during the cycle 24 coastdown, the reactor was automatically tripped from a turbine trip caused by a main generator fault. Safety systems functioned as expected. The Operations staff responded to the event in accordance with applicable plant procedures. An ENS notification (EN 54916) was made for this event at 0416 on September 27, 2020.</p> <p>The post trip relay positions indicated that a main generator fault in the 25-kV portion of the generator output caused a main generator trip, which in turn caused the turbine trip. Initial walkdowns did not identify any obvious damage to the main generator or isolated phase (isophase) bus system. Review of the relay data identified that the fault occurred in the B phase. Closer inspection of the isolated phase bus system identified a detached piece of a laminated sheet-style flexible link that was located inside the bus duct within the turbine building.</p> <p>The initiating cause of the main generator/reactor trip was a laminated sheet on the 5B flexible link became detached and caused a phase-to-ground fault on B phase of the 25-kV isophase bus system. This actuated the main generator protection system, which resulted in a turbine trip (with reactor power above the P-9 setpoint) and an automatic reactor trip.</p> <p>Per plant design, an auxiliary feedwater system actuation occurred as expected in response to the reactor trip.</p> </div> <div> 4. ASSESSMENT OF SAFETY CONSEQUENCES: <p>There were no actual nuclear, radiological, or personnel safety impacts associated with this event. The potential impact was on nuclear safety with respect to challenging the reactor trip system as well as any potential challenges to the plant due to the transient associated with a reactor trip. However, all safety systems functioned as designed, and the reactor automatically tripped (i.e., shut down) per design when the main generator ground fault was detected.</p> </div>			

NRC FORM 366A (08-2020)	U.S. NUCLEAR REGULATORY COMMISSION  LICENSEE EVENT REPORT (LER) CONTINUATION SHEET (See NUREG-1022, R.3 for instruction and guidance for completing this form https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)	APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2023 Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to InfoCollects.Resource@nrc.gov , and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk alt: oira_submission@omb.eop.gov . The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.
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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
Callaway Plant, Unit No. 1	05000-483	YEAR	SEQUENTIAL NUMBER	REV NO.
		2020	- 006	- 00

5. REPORTING REQUIREMENTS

This LER is submitted pursuant to 50.73(a)(2)(iv)(A) to report a reactor protection system actuation during startup and an auxiliary feedwater actuation.

Specifically, 10 CFR 50.73(a)(2)(iv)(A) states in part, "The licensee shall report:

(A) Any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B) of this section...

(B) The systems to which the requirements of paragraph (a)(2)(iv)(A) of this section are:

(1) Reactor protection system (RPS) including: reactor scram or reactor trip....

(6) PWR auxiliary or emergency feedwater system

The RPS was actuated on September 27, 2020 at 0203, during the cycle 24 coastdown. This fulfills the reporting requirement of 10 CFR 50.73(a)(2)(iv)(A) by actuation of the system specified in 10 CFR 50.73(a)(2)(iv)(B)(1).

A valid auxiliary feedwater system actuation was initiated after the reactor trip. This fulfills the reporting requirement of 10 CFR 50.73(a)(2)(iv)(A) by actuation of the system specified in 10 CFR 50.73(a)(2)(iv)(B)(6).

6. CAUSE OF THE EVENT

A main generator fault in the 25-kV portion of the generator output caused a main generator trip, which in turn caused the turbine trip/reactor trip. Inspection of the isolated phase bus system identified a detached piece of a laminated sheet-style flexible link that was located inside the bus duct. The laminated sheet on the 5B flexible link became detached and caused a phase-to-ground fault on B phase of the 25-kV isophase bus system. This actuated the main generator protection system, which resulted in a turbine trip (with reactor power above the P-9 setpoint) and an automatic reactor trip.

7. CORRECTIVE ACTIONS

All isophase flexible link locations were inspected and repaired, as necessary. Callaway continues to consider additional actions that may be taken to improve the flexible link design configuration. Additional plant changes that may be pursued will be provided in a supplement to this LER as warranted.

8. PREVIOUS SIMILAR EVENTS

On July 26, 2013, electrical faults caused damage to the isophase bus in the auxiliary transformer and main generator neutral connection box which caused a generator trip and subsequent reactor trip. See LER 2013-008.

On December 3, 2014 a turbine trip occurred, when the main generator excitation transformer faulted to ground. This resulted in a reactor trip classified as uncomplicated and safety systems performed as designed. See LER 2014-006.